

Monitoring and GIS Mapping of San Diego's Watersheds

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Introduction

Watershed Monitoring Program Objectives

1. Assess the health of San Diego County waterways through monthly water sampling events and comprehensive environmental data collection.
2. Foster citizen involvement in pollution abatement and source tracking.
3. Share water quality data widely with project partners and the public.
4. Provide interpreted data in an easy to understand, transparent way available on the web.
5. Empower the public to make informed decisions about personal water contact based on up-to-date information readily available.
6. Educate the public regarding water quality issues and daily activities that contribute to, or prevent water pollution.
7. Incorporate new strategies to address citizen polluting behaviors such as Community Based Social Marketing and Community Enhancement projects.

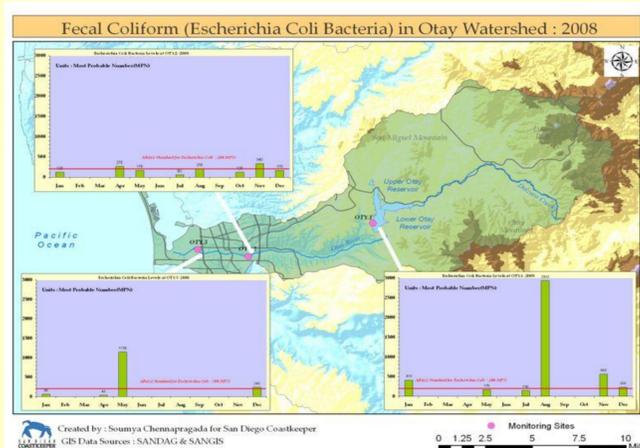
Methods and Results

Adam Taylor, San Diego Coastkeeper Lab Duties :

- Managing data from water monitoring events
- Organizing and analyzing data
- Testing water samples for bacteria, nitrates, and phosphates
- Coordinating volunteers



Water samples collected from the field ready to be processed.



Above image: GIS map of Otoy Watershed showing sites monitored and expressed data levels of E.Coli at those sites through 2008.

The image below shows the eleven main watersheds of San Diego county, ten of which are monitored by Coastkeeper.



Watersheds are basin shaped areas of land where water from rain or snow flows down from higher elevation to lower lands and into streams, rivers, estuaries, and eventually the ocean

Doug Mengers, San Diego Coastkeeper GIS/Lab Duties :

- Set up GIS structure on Coastkeeper's servers
- Convert raw collection data to GIS format
- Create reference maps for each watershed
- Post the data and maps to the website



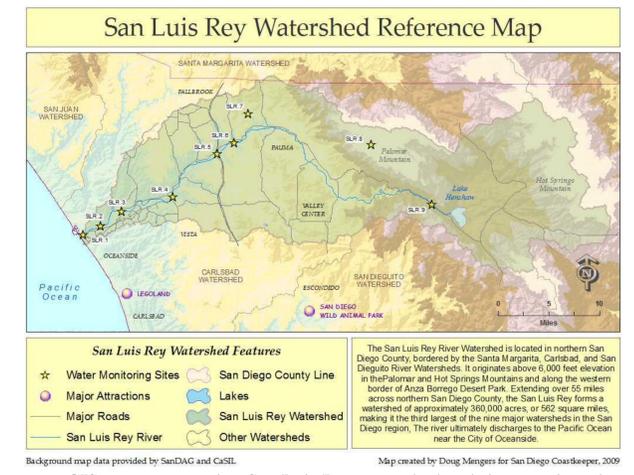
Doug getting into some GIS at Coastkeepers Lab

Water Monitoring steps:

- Water samples are collected in the field
- Data is organized and entered into computer
- Data is quality checked
- Final checked data is sent to GIS program for visual representation and mapping
- Visual models are put onto wiki @ www.sdwatersheds.org

Subst	Date	Nitrate	Phosphate	TCalkres	EColi	Enteroc	AirTemp	WaterTemp	Dissymen	PH	Lat65	Length	Lat85
CRK-EC-1	11/20/2008	0.14	0.79233333	4900	400	270	80	20.833333	17.206666	7.53333333	0.57	33.030889	-117.235556
CRK-EC-1	11/20/2008	0.19	0.45555556	18300	300	140	25	14.206666	4.66666666	8.12	33.030889	-117.235556	
CRK-EC-1	11/20/2008	0.36	0.20711111	40300	200	180	25	30.333333	20.666666	5.13333333	33.030889	-117.235556	
CRK-EC-1	11/20/2008	0.35	0.4	18300	400	320	28	22.433333	8.43333333	8.23333333	33.030889	-117.235556	
CRK-EC-1	11/20/2008	0.18	0.18666666	20200	600	520	22	22.033333	17.766666	6.16666666	33.030889	-117.235556	
CRK-EC-1	11/20/2008	0.23	0.91666666	17900	240	470	24	24.666666	20.5	5.23333333	33.030889	-117.235556	
CRK-EC-1	11/20/2008	0.16	0.90666666	10900	170	520	28	32.033333	20.366666	7.42333333	33.030889	-117.235556	
CRK-EC-1	11/20/2008	0.21	0.2	8900	540	1920	18	18.666666	18.633333	1.5	33.030889	-117.235556	
CRK-EC-1	11/20/2008	0.07	0.17333333	3400	530	480	18.5	18.666666	8.5	8.18333333	33.030889	-117.235556	
CRK-EC-1	11/20/2008	0.17	0.35777777	5400	150	150	19	19.333333	19.333333	19.333333	33.030889	-117.235556	
CRK-EC-2	11/20/2008	2.34	0.36666666	5700	170	190	21	15	5.3	8.83333333	33.04025	-117.2875	
CRK-EC-2	11/20/2008	0.11	0.43333333	16300	280	190	22	18.666666	14.166666	4.86666666	33.04025	-117.2875	
CRK-EC-2	11/20/2008	0.43	0.20777777	40300	170	150	25	20.8	5.83333333	8.33333333	33.04025	-117.2875	
CRK-EC-2	11/20/2008	0.37	0.25222222	20200	220	270	25	18.666666	25.966666	6.6	33.04025	-117.2875	
CRK-EC-2	11/20/2008	0.25	0.25222222	20200	180	480	24	20.4	6.03333333	7.8	33.04025	-117.2875	
CRK-EC-2	11/20/2008	2.42	0.39	26750	180	540	25	21	8.76666666	7.76666666	33.04025	-117.2875	
CRK-EC-2	11/20/2008	0.23	0.2	6870	120	130	18	28.333333	18.966666	8.23333333	33.04025	-117.2875	
CRK-EC-2	11/20/2008	0.07	0.17333333	3400	530	480	18.5	18.666666	8.5	8.18333333	33.04025	-117.2875	
CRK-EC-2	11/20/2008	0.17	0.35777777	5400	150	150	19	19.333333	19.333333	19.333333	33.04025	-117.2875	
CRK-EC-2	11/20/2008	0.16	0.32777777	5400	150	150	19	19.333333	19.333333	19.333333	33.04025	-117.2875	
CRK-EC-3	11/20/2008	0.10	0.27333333	4900	20	40	21	16.966666	5.03333333	8.46666666	33.071666	-117.184000	
CRK-EC-3	11/20/2008	1.4	0.14666666	34000	60	80	24	18.666666	7.0	8.46666666	33.071666	-117.184000	
CRK-EC-3	11/20/2008	0.17	0.17333333	17400	180	40	18	18.666666	24.8	6.2	33.071666	-117.184000	
CRK-EC-3	11/20/2008	0.78666666	0.78666666	34000	20	30	28	23.133333	8.76666666	6.5	33.071666	-117.184000	
CRK-EC-3	11/20/2008	0.1	0.1	17400	40	20	20	20.833333	7.8	8.8	33.071666	-117.184000	
CRK-EC-3	11/20/2008	0.21	0.23333333	3610	250	180	7.8	8.36666666	8.36666666	8.36666666	33.071666	-117.184000	
CRK-EC-3	11/20/2008	0.15	0.18666666	1410	180	20	18	17.9	12.433333	8.56666666	33.071666	-117.184000	
CRK-EC-3	11/20/2008	0.15	0.15333333	1410	180	20	18	17.9	12.433333	8.56666666	33.071666	-117.184000	

Data from Carlsbad watershed converted for GIS formatting



GIS map representing San Luis Rey watershed and sites monitored



Conclusion

Adam Taylor

By working in a team oriented environment at San Diego Coastkeeper I was able to explore many new areas within my field of interest. Working side by side with teammates who had different tasks but were all focused by the same common goal of water quality gave me the opportunity to broaden my career options. I would like to thank the MESA program, San Diego Coastkeeper, and the National Science Foundation for this incredible opportunity.

Doug Mengers

During my internship with the San Diego Coastkeeper, I was able to work with real-world data and challenges in the Geographic Information Systems field. This experience has been invaluable in expanding my knowledge of GIS and has increased my value to current and future employers. I would like to thank the MESA program, San Diego Coastkeeper, and the National Science Foundation for this rewarding opportunity.